PB-243 605

LAKE CALAHOUN, HENNEPIN COUNTY, MINNESOTA

Pacific Northwest Environmental Research Laboratory

Prepared for:

National Environmental Research Center

June 1975

DISTRIBUTED BY:

NTIS

National Technical Information Service
U. S. DEPARTMENT OF COMMERCE

24

PB 243 605

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL EUTROPHICATION SURVEY

WORKING PAPER SERIES

Reproduced by
NATIONAL TECHNICAL
INFORMATION SERVICE
U S Department of Commerce
Springfield VA 22151

PACIFIC NORTHWEST ENVIRONMENTAL RESEARCH LABORATORY

An Associate Laboratory of the

NATIONAL ENVIRONMENTAL RESEARCH CENTER - CORVALLIS, OREGON

and

NATIONAL ENVIRONMENTAL RESEARCH CENTER - LAS VEGAS, NEVADA

☆GPO—697-032

25

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Report on Lake Calhoun, Hennepin County, Minnesota		5. REPORT DATE Prepared June 1975 6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) Anonymous (National Eutrophication Survey Staff)		8. PERFORMING ORGANIZATION REPORT NO. Working Paper # 90
9. PERFORMING ORGANIZATION NAME AND ADDRESS National Eutrophication Survey U.S. Environmental Protection Agency 200 S. W. 35th St. Corvallis, Oregon 97330		10. PROGRAM ELEMENT NO. 11. CONTRACT/GRANT NO.
12. SPONSORING AGENCY NAME AND ADDRESS Office of Research and Development U.S. Environmental Protection Agency 401 M Street, S. W. Washington, DC 20460		13. TYPE OF REPORT AND PERIOD COVERED Final - 1972 14. SPONSORING AGENCY CODE

15. SUPPLEMENTARY NOTES
Prepared in cooperation with the U.S. Environmental Protection Agency, National Environmental Research Center, Las Vegas, Nevada 89114

16. ABSTRACT

Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivided according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
eutrophication lakes nutrients phosphorus nitrogen loading		05B 05C

PRICES SUBJECT TO CHANGE

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS (This Report)	21. NO. OF PAGES
Release unlimited		25
	20. SECURITY CLASS (This page)	22. PRICE
		$3.25 - 2.25

EPA Form 2220-1 (9-73)

218087

REPORT
ON
LAKE CALHOUN
HENNEPIN COUNTY
MINNESOTA

EPA REGION V

WORKING PAPER No. 90

WITH THE COOPERATION OF THE

MINNESOTA POLLUTION CONTROL AGENCY

AND THE

MINNESOTA NATIONAL GUARD

JUNE, 1975

CONTENTS

	Page
Foreword	ii
List of Minnesota Study Lakes	iv, v
Lake and Drainage Area Map	vi
Sections	
I. Introduction	1
II. Conclusions	1
III. Lake and Drainage Basin Characteristics	3
IV. Lake Water Quality Summary	4
V. Literature Reviewed	8
VI. Appendices	9

F O R E W O R D

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to fresh water lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point-source discharge reduction and non-point source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS*

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

* The lake discussed in this report was included in the National Eutrophication Survey as a water body of interest to the Minnesota Pollution Control Agency. This report relates only to the data obtained from lake sampling.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's fresh water lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by EPA and to augment plans implementation by the states.

ACKNOWLEDGMENT

The staff of the National Eutrophication Survey (Office of Research & Development, U. S. Environmental Protection Agency) expresses sincere appreciation to the Minnesota Pollution Control Agency for professional involvement and to the Minnesota National Guard for conducting the tributary sampling phase of the Survey.

Grant J. Merritt, Director of the Minnesota Pollution Control Agency, John F. McGuire, Chief, and Joel G. Schilling, Biologist, of the Section of Surface and Groundwater, Division of Water Quality, provided invaluable lake documentation and counsel during the course of the Survey; and the staff of the Section of Municipal Works, Division of Water Quality, were most helpful in identifying point sources and soliciting municipal participation in the Survey.

Major General Chester J. Moeglein, the Adjutant General of Minnesota, and Project Officer Major Adrian Beltrand, who directed the volunteer efforts of the Minnesota National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

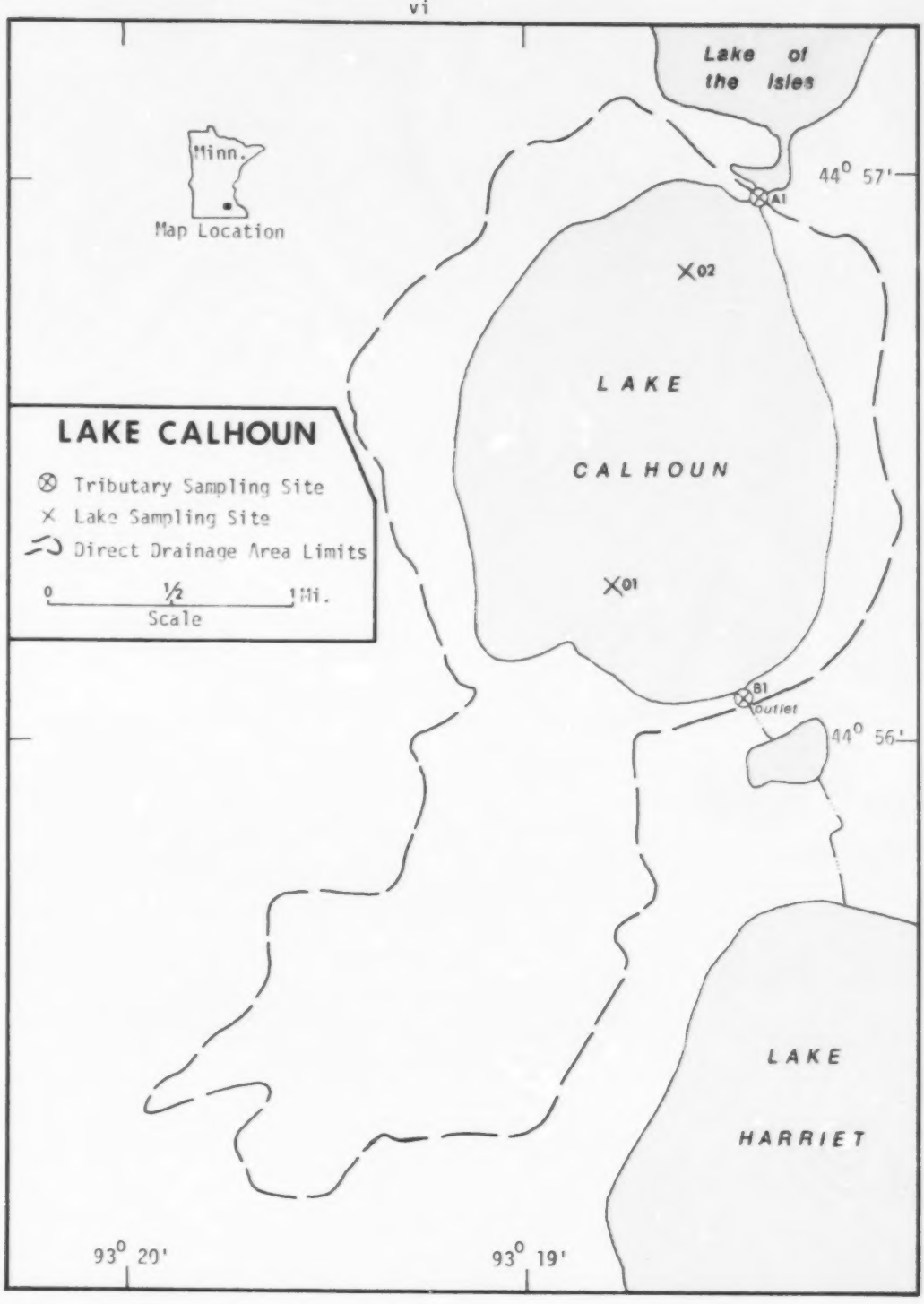
NATIONAL EUTROPHICATION SURVEY

STUDY LAKES

STATE OF MINNESOTA

LAKE NAME	COUNTY
Albert Lea	Freeborn
Andrusia	Beltrami
Badger	Polk
Bartlett	Koochiching
Bear	Freeborn
Bemidji	Beltrami
Big	Stearns
Big Stone	Big Stone, MN; Roberts, Grant, SD
Birch	Cass
Blackduck	Beltrami
Blackhoof	Crow Wing
Budd	Martin
Buffalo	Wright
Calhoun	Hennepin
Carlos	Douglas
Carrigan	Wright
Cass	Beltrami, Cass
Clearwater	Wright, Stearns
Cokato	Wright
Cranberry	Crow Wing
Darling	Douglas
Elbow	St. Louis
Embarass	St. Louis
Fall	Lake
Forest	Washington
Green	Kandiyohi
Gull	Cass
Heron	Jackson
Leech	Cass
Le Homme Dieu	Douglas
Lily	Blue Earth
Little	Grant
Lost	St. Louis

LAKE NAME	COUNTY
Madison	Blue Earth
Malmedal	Pope
Mashkenode	St. Louis
McQuade	St. Louis
Minnetonka	Hennepin
Minnewaska	Pope
Mud	Itasca
Nest	Kandiyohi
Pelican	St. Louis
Pepin	Goodhue, Wabasha, MN; Pierce, Pepin, WI
Rabbit	Crow Wing
Sakatah	Le Sueur
Shagawa	St. Louis
Silver	McLeod
Six Mile	St. Louis
Spring	Washington, Dakota
St. Croix	Washington, MN; St. Croix, Pierce, WI
St. Louis Bay	St. Louis, MN; Douglas, WI
Superior Bay	St. Louis, MN; Douglas, WI
Swan	Itasca
Trace	Todd
Trout	Itasca
Wagonga	Kandiyohi
Wallmark	Chisago
White Bear	Washington
Winona	Douglas
Wolf	Beltrami, Hubbard
Woodcock	Kandiyohi
Zumbro	Olmstead, Wabasha


Lake of the Isles
Minn.
Map Location
44° 57'
A1
X02
LAKE
CALHOUN
X01
LAKE CALHOUN
⊗ Tributary Sampling Site
× Lake Sampling Site
Direct Drainage Area Limits
0 ½ 1 Mi.
Scale
B1
Outlet
44° 56'
LAKE
HARRIET
93° 20'
93° 19'

/.

LAKE CALHOUN

STORET NO. 27B6

I. INTRODUCTION

Lake Calhoun was included in the National Eutrophication Survey as a water body of interest to the Minnesota Pollution Control Agency. No known wastewater treatment plants impact the lake, and tributary sampling was minimal because of lack of flows (the data obtained are given in Appendix C). Therefore, this report primarily relates to lake sampling data.

II. CONCLUSIONS

A. Trophic Condition:

Survey data show that Lake Calhoun is eutrophic. Of the 60 Minnesota lakes on which sample was completed, 37 had less mean total phosphorus, 39 had less mean dissolved phosphorus, 44 had less mean inorganic nitrogen, 24 had less mean chlorophyll a, and 18 had greater mean Secchi disc transparency.

This central Minneapolis lake is characterized by summer fish-kills and seasonal anaerobic bottom conditions with hydrogen sulfide formation. High nutrient levels with severe oxygen depression in the hypolimnion are indicative of excessive organic loadings to the lake. The lake has a record of high chloride input, including some storm water pollution (Schilling, 1974).

B. Rate-Limiting Nutrient:

The algal assay sampled collected by Survey limnologists in October, 1972, was lost in shipment to the laboratory. Personnel of the Minnesota Pollution Control Agency collected another assay sample on April 27, 1973, during spring turnover. The results of the assay indicate Lake Calhoun was phosphorus limited at that time.

The lake data obtained in 1972 indicate nitrogen limitation in July, September, and October.

III. LAKE AND DRAINAGE BASIN CHARACTERISTICS

A. Lake Morphometry†:

1. Surface area: 416 acres.
2. Mean depth: 34.8 feet.
3. Maximum depth: 90 feet.
4. Volume: 14,477 acre-feet.

B. Tributary and Outlet:
(See Appendix A for flow data)

1. Tributaries -

Name	Drainage area (mi^2)*	Mean flow (cfs)*
Lake of Isles outlet	4.4	1.1
Minor tributaries & immediate drainage -	4.0**	1.0
Totals	8.4**	2.1

2. Outlet - Closed basin; no normal surface water overflow.

C. Precipitation***:

1. Year of sampling: 27.5 inches.
2. Mean annual: 27.3 inches.

---

† MN Dept. of Conservation lake survey map (1954).
* Drainage areas are accurate within ±5%; mean daily flows are accurate within ±10%; and ungaged flows are accurate within ±10 to 25% for drainage areas greater than 10 mi^2.
** Includes area of lake.
*** See Working Paper No. 1, "Survey Methods, 1972".

IV. LAKE WATER QUALITY SUMMARY

Lake Calhoun was sampled three times during the open-water season of 1972 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from two stations on the lake and from a number of depths at each station (see map, page vi). During each visit, a single depth-integrated (15 feet to surface) sample was composited from the stations for phytoplankton identification and enumeration; and during the last visit, a single five-gallon depth-integrated sample was composited for algal assays. Also each time, a depth-integrated sample was collected from each of the stations for chlorophyll a analysis. The maximum depths sampled were 65 feet at station 1 and 78 feet at station 2.

The results obtained are presented in full in Appendix B, and the data for the fall sampling period, when the lake essentially was well-mixed, are summarized in the following table. Note, however, the Secchi disc summary is based on all values.

For differences in the various parameters at the other sampling times, refer to Appendix B.

A. Physical and chemical characteristics:

Parameter	Minimum	Mean	Median	Maximum
		FALL VALUES (10/27/72)		
Temperature (Cent.)	9.3	9.5	9.5	9.6
Dissolved oxygen (mg/l)	7.9	9.0	8.7	10.2
Conductivity (μmhos)	460	476	480	480
pH (units)	7.4	7.7	7.7	7.9
Alkalinity (mg/l)	118	119	119	122
Total P (mg/l)	0.069	0.127	0.091	0.303
Dissolved P (mg/l)	0.057	0.104	0.073	0.240
NO_2 + NO_3 (mg/l)	0.070	0.075	0.070	0.100
Ammonia (mg/l)	0.630	0.658	0.650	0.740
		ALL VALUES		
Secchi disc (inches)	50	72	63	119

B. Biological characteristics:

1. Phytoplankton -

Sampling Date	Dominant Genera	Number per ml
07/07/72	1. Anabaena	3,297
	2. Microcystis	1,739
	3. Dinobryon	797
	4. Chroococcus	652
	5. Tabellaria	254
	Other genera	1,015
	Total	7,754
09/05/72	1. Anabaena	3,653
	2. Flagellates	344
	3. Aphanocapsa	271
	4. Closterium	253
	5. Dinobryon	235
	Other genera	687
	Total	5,443
10/27/72	1. Stichococcus	3,367
	2. Flagellates	2,814
	3. Oscillatoria	2,211
	4. Dinobryon	854
	5. Synedra	402
	Other genera	2,864
	Total	12,512

2. Chlorophyll a -
(Because of instrumentation problems during the 1972 sampling, the following values may be in error by plus or minus 20 percent.)

Sampling Date	Station Number	Chlorophyll a (µg/l)
07/07/72	01	12.2
	02	9.7
09/05/72	01	6.2
	02	7.5
10/27/72	01	19.7
	02	18.0

C. Limiting Nutrient Study:

1. Autoclaved, filtered, and nutrient spiked -

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum yield (mg/l-dry wt.)
Control	0.018	0.620	4.3
0.010 P	0.028	0.620	9.5
0.020 P	0.038	0.620	13.2
0.050 P	0.068	0.620	17.5
0.050 P + 5.0 N	0.068	1.120	20.5
0.050 P + 10.0 N	0.068	1.620	26.4
10.0 N	0.018	1.620	3.8

2. Discussion -

The control yield of the assay alga, Selenastrum capricornutum, indicates that the potential primary productivity of Lake Calhoun was moderately high at the time the sample was taken (April 27, 1973). Also, the increased yields with increased levels of orthophosphorus show the lake was phosphorus limited at that time.

The 1972 lake data indicate nitrogen limitation in July (N/P ratio = 8/1), September (N/P = 9/1), and October (N/P = 7/1).

V. LITERATURE REVIEWED

Schilling, Joel, 1974. Personal communication (compendium of information on Minnesota study lakes). MPCA, Minneapolis.

VI APPENDICES

APPENDIX A

TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR MINNESOTA 10/30/74

LAKE CODE 2786 CALHOUN LAKE

TOTAL DRAINAGE AREA OF LAKE 8.41

TRIBUTARY	SUB-DRAINAGE AREA	NORMALIZED FLOWS JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
2786A1	4.36	0.06	0.09	0.64	2.89	2.52	3.15	1.36	0.45	0.48	0.87	0.43	0.15	1.09
2786ZZ	4.05	0.05	0.07	0.71	2.61	2.18	2.94	1.17	0.34	0.40	0.65	0.32	0.13	0.96

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 8.41
SUM OF SUB-DRAINAGE AREAS = 8.41
TOTAL FLOW IN = 24.66
TOTAL FLOW OUT = 0.0

NOTE *** THIS IS A CLOSED BASIN WITH NO NORMAL SURFACE WATER OUTFLOW

MEAN MONTHLY FLOWS AND DAILY FLOWS

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
2786A1	10	72	0.45	14	0.30				
	11	72	1.00						
	12	72	0.16						
	1	73	0.16	9	0.20				
	2	73	0.11						
	3	73	0.65						
	4	73	6.96						
	5	73	2.57						
	6	73	1.07	30	0.20				
	7	73	1.21	31	1.33				
	8	73	0.43	30	0.41				
	9	73	0.41	30	0.56				
2786ZZ	10	72	0.34	14	0.30				
	11	72	0.37						
	12	72	0.14						
	1	73	0.13	9	0.20				
	2	73	0.08						
	3	73	0.72						
	4	73	6.29						
	5	73	2.22						
	6	73	1.00	30	0.20				
	7	73	1.04	31	1.14				
	8	73	0.33	31	0.29				
	9	73	0.34	30	0.48				

APPENDIX B

PHYSICAL and CHEMICAL DATA

STORET RETRIEVAL DATE 74/10/30

12

274601
44 56 18.0 093 18 42.0
CALHOUN LAKE
27 MINNESOTA

11EPALES 2111202
3 0034 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/07/07	09 35	0000			58	430	8.50	94	0.070	0.130	0.021	0.012
	09 35	0004	18.8	8.6				97	0.040	0.050	0.037	0.013
	09 35	0015	12.0	8.4		430	8.40	98	0.040	0.050	0.027	0.014
	09 35	0020	9.5									
	09 35	0025				500	7.30					
	09 35	0028	8.0	0.6				135	0.260	0.540	0.101	0.070
72/09/05	09 40	0000			50	460	8.25	116	0.060	0.210	0.067	0.023
	09 40	0004	18.9	6.0		460	8.15	116	0.040	0.250	0.069	0.023
	09 40	0015	18.6	3.6		458	7.75	116	0.030	0.380	0.063	0.031
	09 40	0021	18.6	3.1		460	7.70	116	0.040	0.400	0.054	0.031
	09 40	0027	18.5	2.5		460	7.68	115	0.050	0.460	0.065	0.028
72/10/27	08 45	0000			119	480	7.40	119	0.070	0.650	0.091	0.073
	08 45	0004	9.5	7.9		460	7.60	119	0.070	0.650	0.116	0.092
	08 45	0015	9.4	9.8		470	7.60	119	0.070	0.650	0.140	0.114
	08 45	0030	9.4	8.4		470	7.60	119	0.070	0.650	0.141	0.126
	08 45	0040	9.4	10.2		480	7.60	120	0.070	0.650	0.189	0.168
	08 45	0050	9.4	8.6		480	7.70	120	0.080	0.670	0.303	0.240
	08 45	0065	9.3	8.4		480	7.70	122	0.100	0.740	0.222	0.175

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/07/07	09 35	0000	12.2J
72/09/05	09 40	0000	6.2J
72/10/27	08 45	0000	19.7J

J VALUE KNOWN TO BE IN ERROR

STORET RETRIEVAL DATE 74/10/10

27A602
44 56 48.0 093 1M 39.0
CALHOUN LAKE
27 MINNESOTA

11EPALES 2111202
3 0070 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CONDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/07/07	10 45	0000			63	420	8.50	97	0.050	0.030	0.026	0.014
	10 45	0004	21.0	10.4				97	0.040	0.050	0.032	0.014
	10 45	0015	19.9	5.0		440	8.00	106	0.050	0.050	0.027	0.013
	10 45	0020	13.0	1.1		440	8.10	130	0.160	0.100	0.030	0.013
	10 45	0025	8.5	1.6								
	10 45	0050	7.0	0.4		490		131	0.100	1.600	0.281	0.251
	10 45	0077	7.0	6.0		495	7.10	133	0.070			
72/09/05	10 10	0000			68	460	7.95	117	0.040	0.310	0.069	0.024
	10 10	0004	18.6	4.4		460	7.93	114	0.040	0.340	0.065	0.024
	10 10	0015	18.5	4.0		460	7.85	119	0.040	0.350	0.061	0.026
	10 10	0022	18.4	4.2		460	7.90	116	0.040	0.360	0.058	0.030
	10 10	0030	18.2	3.2		460	7.85	117	0.040	0.410	0.068	0.031
	10 10	0040	17.9	2.0		460	7.60	119	0.030	0.500	0.072	0.040
	10 10	0053	16.4	0.2		470	7.38	118	0.030	0.650	0.092	0.056
	10 10	0065	12.0	0.0		520	7.15	119	0.080	0.810	0.640	0.033
	10 10	0078	9.5	0.0		520	7.15	143	0.130	2.540	0.558	0.562
72/10/27	10 30	0000				470	7.80	120	0.070	0.650	0.069	0.060
	10 30	0004	9.5	9.4		480	7.90	120	0.070	0.640	0.076	0.062
	10 30	0015	9.4	8.7		480	7.90	121	0.070	0.630	0.076	0.057
	10 30	0025	9.6	8.7		480	7.90	118	0.070	0.650	0.081	0.061
	10 30	0035	9.6	9.6		480	7.90	118	0.090	0.680	0.077	0.067
	10 30	0040	9.6	9.1		480	7.90	118	0.070	0.650	0.073	0.060

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLOPHYL A UG/L
72/07/07	10 45	0000	9.7J
	10 45	0050	7.2
72/09/05	10 10	0000	7.[illegible]
72/10/27	10 30	0000	14.[illegible]

J [illegible]

APPENDIX C

TRIBUTARY DATA

STORET RETRIEVAL DATE 74/10/30

27H6A1 LS27B6A1
44 57 00.0 093 18 30.0
LK OF THE ISLES/LK CALHOUN CONN
27 15 MINNEAPOLIS
1/LAKE CALHOUN
US 212 BRDG NE CORNER LAKE CALHOUN
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/10/14	15 23		0.091	1.320	0.399	0.058	0.105
73/06/30	08 30		0.010K	1.680	0.042	0.021	0.060
73/07/31	07 30		0.010K	1.540	0.063	0.017	0.055
73/08/31	10 30		0.025	1.100	0.069	0.015	0.045
73/09/30	14 00		0.012	1.850	0.294	0.039	0.105

K VALUE KNOWN TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 74/10/30

27H6B1 LS27H6B1
44 56 00.0 093 18 30.0
LK CALHOUN/LK HARRIET CONNECTION
27 15 MINNEAPOLIS
O/LAKE CALHOUN
CO HWY 20 XING SSE END NEARBERRY PARK
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/06/30	08 00		0.010K	2.400			
73/08/31	10 45		0.010K	1.150	0.069	0.009	0.042
73/09/30	14 00		0.010K	1.800	0.340	0.039	0.100

K VALUE KNOWN TO BE LESS THAN INDICATED